

Examples are given of the techniques used to investigate the nature of bound residues, which methods include ^{13}C -labelling with use of nuclear magnetic resonance spectroscopy, ^{14}C -labelling followed by various chromatographic approaches and immunoassay methods. The nature of the covalent bonds formed between the organic matter fractions (humins, and humic and fulvic acids) and pesticides or their metabolites is considered for several examples, together with ways to stimulate pesticide breakdown and incorporation.

Finally, on the experimental side, several papers address the question of bioavailability of soil-bound residues. Techniques appraised include use of organisms such as earthworms or plants for uptake studies as well as indirect methods such as extraction followed by chemical analysis. It is of interest to note that the amounts of remobilised pesticides or their degradation products were very small in the examples given, and it is reassuring that no deleterious effects from non-extractable pesticide residues in soil are reported. A final chapter summarises the research requirements and some of the approaches and cautions in what can be a difficult area of work.

This book will appeal to the specialist researcher or pesticide regulator, and provides a good background to this topic.

Richard H Bromilow

Metabolic pathways of agrochemicals. Part one – herbicides and plant growth regulators

Ed-in-chief T Roberts

Royal Society of Chemistry, Cambridge, 1998

price UK £225.00

ISBN 0 854 004 494 9

Bringing together a large amount of previously disparate information, this volume will be welcomed by the herbicide community.

Comprehensively detailing pathways for the environmental and metabolic fate of most currently used products, each entry consists of a standardised, easy-to-read format describing physicochemical properties, chemical degradation and fate in soil, plants and animals. Each entry is accompanied by appropriate metabolic maps and references. A helpful feature is a concise overview of the properties of each chemical family. The book should establish itself as an authoritative reference work in a critically important field, in the years to come.

Some oversights are lack of referencing of mode-of-action statements, and inconsistencies in organism nomenclature – here, a glossary would have been helpful. It was unwise to group certain herbicides, including glyphosate, as ‘organophosphorus com-

pounds’ and I hope these points will be rectified in future editions.

David J Cole

Insecticides of natural origin

Sukh Dev and Opendar Koul

Harwood Academic Publishers, The Netherlands, 1997

365 pp, price UK£72.00

ISBN 3 7186 5913 1

As someone very interested in new approaches to the description of biologically active compounds from natural origins, I am always keen to read new texts that might offer innovative insights and identify commercially viable opportunities in this exciting area of research. This book has two sections: the first is an introduction, whilst the second is a list of 324 compounds that have been claimed at one time or another to be both natural and insecticidal. The introduction tells the reader that the book presents ‘information in a proper scientific and economic perspective and highlights economically useful leads’. However, the only mention of azadirachtin in the entire book is in the first paragraph; it is not even included in the lists of natural compounds at the end nor is it mentioned in the index (which, incidentally, looks as if it has been added as an afterthought), a very strange situation for a compound that is becoming increasingly lauded for its natural insecticidal effects. If pyrethrum, nicotine and rotenone are excluded, azadirachtin has to be the most widely used natural compound for insect control. I also wonder how useful a table of the 61 plant families that possess species which produce insecticidal compounds is, without some ranking. Are the Poaceae as abundant a producer as the Meliaceae?

In part 2, the list of compounds is arranged by chemistry but separated into higher plants (222), micro-organisms (67), animals (4) and marine organisms (31). The entries contain the structure (where known), the source organism (unclassified beyond genus and species), the test species (with authorities – a significant plus for this) and references. A useful starting point but it could be so much more. The test species and the assays are different, entry to entry, and there is never a standard included so it is not possible to determine how effective the compounds actually are. This is probably not the fault of the authors but is a constant problem with data generated by those working on natural products (it reminds me of an old story of a man who had discovered a product with 10 000 times the wear and 25 000 times the grip but, as his comparator had been a banana, he did not think he had a new car tyre product). However, it would have been helpful to have had some interpretation put on the data to allow the reader to get a feel for the

potential of a structure. But there is worse, in that some compounds are reported that have been shown in the literature not to be the assigned structure. This casts significant doubt on the validity of several of the entries. A pity, this is not the book I was looking for, but it is a fairly extensive, if not thorough, review of published data.

Leonard G Copping

Integrated pest management: Ideals and realities in developing countries

Stephen Morse and William Buhler

Lynne Rienner Publishers, Boulder, Colorado, USA, 1997

555 pp, price US\$49.95

ISBN 1 55587 685 4

Integrated pest management ('pest' taken in the narrow sense as an arthropod pest of an agricultural or horticultural crop) is a concept which is endorsed by the majority of advisors and specialists as the way forward for developed agricultural systems. It has not had many takers among farmers in the developing world and this book sets out to analyse why this might be so.

Chapter 1 describes the great variety of views as to what IPM really is. Most popular definitions encompass non-chemical control methods, economic factors, risk management, and knowledge-based decision making, but more recent assessments include 'a ...term so common and bastardized that everyone ...will tell you they are practising (it)' (Barfield and Swisher, 1994) and the view that '...even a common general understanding of what constitutes legitimate IMP also presents serious problems. First it means that a *de facto* standard of 'anything goes' prevails by default' (Moore, 1996). From this refreshingly honest

starting point, Chapter 2 considers four 'core elements' of IPM which have proved stumbling blocks to its implementation in developing agricultural systems: the need to monitor arthropod pest populations, the need to reduce pesticide use, the need for farmers to have an appropriate knowledge base and the ability of extension services to provide it.

IPM has its own socio-economic history, reviewed in Chapter 3. The authors trace the development of IPM through the publicly funded research programmes which accompanied the industrialisation of agriculture in the United States during the second half of this century and assess the way in which the assumptions underlying these programmes influenced the pest management strategies proposed. This is followed in Chapter 4 by a critical analysis of some of the standard IPM success stories and some suggestions about the circumstances necessary for their success. Because these are so different from the conditions under which IPM is being attempted in many countries, the reasons why IPM has become such a dominant paradigm within entomological research are subjected to some close scrutiny. Chapters 3 and 4 develop the theme by contrasting the practicability of IPM in heavily capitalized industrial agriculture with that in resource-poor farming systems. Finally, Chapters 5 and 6 trace the manner in which IPM continuously re-invents itself by incorporating new technologies, removing it ever further from the reach of resource-poor farmers, and Chapter 7 attempts to suggest an alternative strategy (RPM, realistic pest management) to the virtual imposition of IPM on farming communities in poor countries.

This is a refreshing and iconoclastic book which should be required reading for students of applied biology. In 171 pages it challenges some of the cherished myths of IPM and subjects them to some long-overdue scrutiny.

G le Patourel